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Jeffery J. Brosemer, Ph.D., ESQ.
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EXAMINER

NGUYEN, VAN KIM T

ART UNIT	PAPER NUMBER
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2152

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/749,947	Applicant(s) IZMAILOV ET AL.	
	Examiner Van Kim T. Nguyen	Art Unit 2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>May 19, 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to communications filed on December 31, 2003.

Claims 1-30 were presented. Applicant has elected claims 9-30 for examination.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-8, drawn to protocol implementing, classified in class 709, subclass 230.

II. Claims 9-30, drawn to file transferring, classified in class 709, subclass 232.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the subcombination has separate utility such as invention is directed toward an protocol implementing, while invention II is directed toward file transferring.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable

Art Unit: 2100

in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

4. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an

Art Unit: 2100

election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

5. During a telephone conversation with Jeffery Brosemer on September 18, 2007, a provisional election was made without traverse to prosecute the invention of group II, claims 9-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-8 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Information Disclosure Statement

6. The information disclosure statement (IDS) submitted on May 19, 2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

7. Claim 29 is objected to because of the following informalities:

Claim 29 recites the limitation “(push)” and “(pull)” in line 3. It is not clear whether the recited limitations are parts of the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 26 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 recites the limitation “clocking out available data packets in the sink buffer selected by step c)” in line 9. However, “step c)” has not been disclosed in any of the claims that claim 26 depends on. Because of this, claimed limitations of claim 26 will not be considered for applying arts.

Similarly, claim 28 recites the limitation “looking up the forwarding table installed by step a)”. However, “step a)” has not been introduced in any of the claims that claim 28 depends on. Because of this, claimed limitations of claim 28 will not be considered for applying arts.

Claim Rejections - 35 USC § 102

10. The following is a quotation of 35 U.S.C. 102(e) which forms the basis for all obviousness rejections set forth in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 9-21 and 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Tichy et al (US 2006/0101025), hereinafter Tichy.

Regarding claim 9, as shown in Figure 9b, Tichy discloses a method of file transfer in a computer-based communication network (i.e., source server) by utilizing an overlay network composed of cooperating servers on computer hosts (i.e., sink server), the computer hosts connected to the communication network, wherein each of the server contains instructions which, when executed by the server, cause the server to process and forward data via the transport layer to other servers on the overlay network without modifying the native data transport protocol at transport or lower layers, the method comprising the steps of:

defining a first data forwarding path between two servers (i.e., subfile 0 path), the path comprising of concatenation of overlay links, each of the links established via transport layer between two the servers in the overlay network (Figure 9b; para 0101);

defining a second data forwarding path (i.e., subfile 1 path) between two servers, the path different from the first data forwarding path (Figure 9b; para 0101);

dividing the data file in at least two sub-files, first subfile and second sub-file (figure 9b shown the file dividing the file into subfile 0 and subfile 1); and

sending first and second sub-files over the first and second data forwarding paths, respectively (figure 9 shown the file into subfile 0 and subfile 1 is transmitting over subfile 0 path and subfile 0 path respectively).

Regarding claim 30, Tichy also discloses an overlay network apparatus for determining optimized paths and trees for transmitting data from a source to destinations within a computer-based communications network, the communications network being characterized by one or more established communications protocols, the apparatus comprising:

a set of one or more intermediate nodes, the intermediate nodes being operable to transmit and receive data in conformance with the established communications protocols (i.e., I/O nodes 0 and 1, Figures 9-10, para 0100-0104);

path and trees discovery means, responsive to a request for transmitting data from the sources to the destinations, operable to discover network resources on virtual links between the sources and the destinations passing through one or more of the intermediate nodes, the paths being derived by means of one or more existing routing mechanisms of the communications network, wherein the intermediate nodes define a virtual topology on top of the computer-based communications network (i.e., nested FALLS can be represented as a tree, to be seen as a collection of line segments, compactly representing a subset of a file. The nested PITFALLS represents the physical partitioning of a file onto I/O nodes, the logical partitioning of a files only the computer nodes and the mapping between them. Logical and physical distribution can be specified using High-Performance Fortran; para 0076-0082 and 0100 - 0104);

data processing means for data partitioning, storage and replication at the nodes (i.e., physical and logical partitioning of file, read/wire operation for gathering data, and subfile mapping; para 0102-0107); and

forwarding means for forwarding the data from the sources to the destinations by way of paths and trees, without requiring a modification of the established communications protocols (para 0109-0110).

Regarding claim 10, as shown in Figure 9b, Tichy also discloses replicating each sub-file in one or more intermediate servers on the data forwarding paths and forwarding the sub-file to the next server in the path (i.e., subfile 0 replicating the data stream then send it to node 0 and node 1, meanwhile subfile 1 replicating the data stream then send it to node 2 and node 3) and assembling the first and the second sub-files at the second server (Figure 9b; para 0099-0101).

Regarding claim 11, Tichy also discloses for sending first and second sub-files over the first and second data forwarding paths are not started simultaneously [para 0104].

Regarding claim 12, Tichy also discloses the sub-files are transmitted from a single source node (i.e., the node server that storing the file at the root of the tree in Figure 9b to a plurality of destination nodes (i.e., node 0, node 1), and the paths form a data forwarding tree, wherein the intermediate nodes of the tree copy the sub-files reaching them from the incoming overlay link to the plurality of outgoing overlay links (Figures 9b, para 0100-0101).

Art Unit: 2100

Regarding claim 13, Tichy also discloses the sub-files are transmitted from a plurality of source nodes to a plurality of destination nodes, and the forwarding paths form data forwarding trees, wherein the intermediate nodes of the tree copy the data reaching them from the incoming link to the plurality of outgoing links (i.e., nested PITFALLS; Figures 7-8, para 0080-0084 and 0095-0099).

Regarding claim 14, Tichy also discloses the data forwarding and processing resources are reserved, the resources including one or more metrics from the following group: bandwidth of overlay link, processing load of the server (para 0101).

Regarding claim 15, Tichy also discloses the data forwarding and processing resources are determined from network monitoring, the resources including one or more metrics from the following group: bandwidth of overlay link, processing load of the server (para 0101-0102).

Regarding claim 16, Tichy also discloses the overlay network has static topology and resources, the resources including one or more metrics from the following group: bandwidth, processing load (para 0101-0102).

Regarding claim 17, Tichy also discloses the overlay network has dynamic topology and resources, the resources including one or more metrics from the following group: bandwidth, processing load (para 0101-0102).

Regarding claim 18, Tichy also discloses the data forwarding paths are computed in a single server (Figure 10b shown data forwarding paths are computed in a single server, i.e., compute node).

Regarding claim 19, Tichy also discloses the data forwarding paths are computed in several servers, with subsequent coordination of computed results (para 0074-0081).

Regarding claim 20, Tichy also discloses the divisions of the data file into sub-files remain constant for the duration of the file transfer (para 0076).

Regarding claim 21, Tichy also discloses the divisions of the data file into sub-files change during the file transfer (para 0086-0088).

Regarding claim 29, Tichy also discloses the transport of data partitions to a plurality of destination nodes is a combined coordination of transport initiated by the sender and transport initiated by the receivers (para 0086-0088).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tichy, in view of McCanne (US 7,133,928).

Tichy does not explicitly call for data forwarding tree constructed using multicast method.

Regarding claims 22-24, McCanne teaches data forwarding tree constructed using multicast depth-first-search method (col. 3: lines 51-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply McCanne's method of multicasting in Tichy's system, motivated by the need of achieving efficient transfer of information.

Regarding claim 25, McCanne also teaches the established communications protocols include one or more protocols selected from the following group: Internet Protocol, HTTP, FTP, SSL, TCP reliable UDP using erasure coding (e.g., UDP; col. 1: lines 41-45).

14. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tichy, in view of Byers et al ("Informed Content Delivery Across Adaptive Overlay Network", pages 47-60, SIGCOMM'02, August 19-23, 2002), hereinafter Byers.

Regarding claim 27, Tichy does not explicitly call for encoding an application-specific data object identifier into a data frame; extracting the application-specific data object identifier at the destination; and reassembling the application data object according to the data object identifier.

Byers discloses encoding an application-specific data object identifier into a data frame; extracting the application-specific data object identifier at the destination; and reassembling the application data object according to the data object identifier (Sect. 2.3, Benefits of Encoded Content, page 49-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Byers's content encoding technique in Byers' s system, motivated by the need of facilitating simpler and more effective data transferring.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Routing Scheme Based on Virtual Space Representation; Saraph (US 7,231,459);
Method and Apparatus for Composing Virtual Links in a Label Switched Network;
Kanetake (US 7,212,526);

Redirecting Network Traffic Through a Multipoint Tunnel Overlay Network using
Distinct Network Address Spaces for the Overlay and Transport Network; Cassar (US
7,185,107);

Designing Interconnect Fabric; Ward et al (US 7,076,537);

Efficient Precomputation of Quality of Service Routes; Rexford et al (US 6,633,544);

Communication Apparatus and Method of Handover of an Assigned Group Address from
one Communication Apparatus to Another; Hayashi et al (US 6,598,071);

Method and Apparatus for Determining Multiple Minimally-Overlapping Paths between Nodes in a Network; Callon (US 6,256,295);

System and Method for Piecewise Streaming of Video using a Dedicated Overlay Network; Varadarajan et al (US 2004/02555323);

Overlay Network for Location-Independent Communication Between Computer Systems; Graupner (US 2004/0179481);

Method and Arrangement in Telecommunications System; Johnson (US 2003/0162499);

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Van Kim T. Nguyen whose telephone number is 571-272-3073. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Van Kim T. Nguyen

Application/Control Number: 10/749,947
Art Unit: 2100

Page 14

Examiner
Art Unit 2152

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/John Follansbee/
Supervisory Patent Examiner, Art Unit 2151